The Four Season Observer

Winter/Spring 2000
Volume #5, Issue #2

Editors*: *Darin J. Figurskey, WCM
Raymond O'Keefe, Assistant WCM
Jeff Boyne, Forecaster

What's in this Issue?

Upcoming NWS Events

* **Novi Boat Show - Novi Expo Center - March 18 & 19, 2000**

* **General Aviation Presentation - Oakland-Pontiac Airport - April 5, 2000 at 7 PM**

* **AWESOME DAY 2000 - Eddie Edgar Arena - Livonia - May 20, 2000 (10 AM-2 PM)**

How to Reach Us?

The address for all newsletter correspondence is:

National Weather Service Forecast Office
ATTN: The Four Season Observer
9200 White Lake Rd
White Lake, MI 48386

Newsletter on the Internet

Darin J. Figurskey, WCM

During the 1999 Skywarn spotter and safety training sessions conducted by the National Weather Service, those in attendance were reminded of the availability of ***The Four Season Observer*** over the Internet. By going to the Skywarn link on the White Lake office's web site at www.crh.noaa.gov/dtx/start.htm, you have access to the latest newsletter, and previous versions of the newsletter, in pdf format. A link is available for you to download Adobe Acrobat if you don't already have it on your computer. By downloading the newsletter in Adobe, you can read the newsletter in the same format as it is mailed to you.

For those that notified the National Weather Service of Internet capability during the 1999 Skywarn training sessions, this will be the last newsletter mailed to you through the U.S. Postal Service. With the increasing accessibility of the Internet, and due to slowly rising postage and reproduction costs, it has become necessary to decrease the number of newsletter mailings from the current 2,520 newsletters distributed three times annually. However, for those that indicated no Internet access, we will continue to send a copy through regular mail as long as it remains practical to do so.

Actually, for those who have Internet access, you are able to read the newsletter earlier than those who must wait for normal mail delivery. Once the final draft of the newsletter is complete, the newsletter is immediately posted on the Internet at the White Lake office. However, reproduction, labelling, affixing postage, and mailing, all of which are completed at a central facility in Kansas City, can delay receipt of the newsletter for Postal Service customers by two to three weeks.

For those planning to use the Internet, look for newsletters to be published around February 20th and October 20th. If there is an active severe weather season and/or considerable new information to be relayed to Skywarn spotters, an abbreviated edition of the newsletter may be published around the end of June. As always, if you have any comments or suggestions about ***The Four Season Observer***, feel free to contact me. I would enjoy hearing from you.

Thanks!

Darin J. Figurskey, WCM

As is the case each severe weather season, without the assistance of many dedicated volunteers, the ability of the National Weather Service to warn individuals of severe weather, or to forecast thunderstorm strength and path, would be seriously degraded. During 1999, we received 223 individual reports from spotters of both non-severe and severe events, an increase of nearly 50 reports from 1998. These reports undoubtedly assisted our forecasters in understanding exactly what thunderstorms were

doing. Moreover, the reports helped a considerable number of emergency management officials and the general public know what to expect from storms, often through the spotter information we included in special weather statements, severe weather statements, and short-term forecasts.

A hearty thanks go out to all of the Skywarn spotters in southeast Michigan for using your time, talent, and in some cases money, to help protect the lives and property of the nearly 6 million people who live in our area. Your efforts certainly contributed to there being no deaths and only two injuries directly related to severe weather in southeast Michigan in 1999. In fact, through the end of October 1999, preliminary statistics show the White Lake office ranking 6th in the Central Region of the National Weather Service, and 11th in the nation, in terms of severe weather warning success. Of course, our success at the National Weather Service is directly related to the efforts of spotters, and we look forward to another year of teamwork in 2000!

Upcoming Spotter Training Classes

Jeff Boyne, Forecaster

From late January through the end of April, SKYWARN training classes will be held in all 17 counties of southeast Lower Michigan. The NWS sessions will also feature some of the storms that affected southeast Lower Michigan during the 1999 Severe Storm Season.

Like in past years, there will be two tiers of instruction: BASIC and ADVANCED. The BASIC class will include all of the necessary tools to become a SKYWARN spotter. The topics covered include: The General Thunderstorm, The Squall Line (Michigan's most common type of severe thunderstorm), The Supercell (the most dangerous thunderstorm), Tornadoes, Other Severe Weather, and Safety information. Meanwhile, the ADVANCED class will include: A Review of the BASIC Subjects, Single Cell Thunderstorms, Multi-Cell Thunderstorms, Bow Echoes, Heavy Precipitation Supercell (the most common type of Supercell in Michigan), and Cyclic Supercells.

Here is a preliminary list of sites where these SKYWARN programs will be held:

Upcoming SKYWARN Training Sessions*

County	Date	Time	Type	Location
Bay	3/8	7-9 PM	Basic	Great Lakes College on Wilder Rd.
	4/12	7-9 PM	Advanced	Great Lakes College on Wilder Rd.
Genesee	3/11	10 AM-Noon	Basic	County Auditorium
	4/11	7-9 PM	Basic	County Auditorium
	4/15	10 AM-Noon	Advanced	County Auditorium
Huron	3/28	7-9 PM	Basic	Detroit Edison Building at 4100 Doerr Rd. in Cass City
	4/26	7-9 PM	Advanced	Detroit Edison Building at 4100 Doerr Rd. in Cass City
Lapeer	3/30	7-9 PM	Basic	Lapeer East High School Auditorium
Lenawee	4/7	730 PM -930 PM	Basic	Civil Air Patrol Building on Airport on Cadmus Rd.
Livingston	3/16	7-9 PM	Advanced	Livingston County Emergency Operations Center (EOC) at 300 S. Highlander Way
Macomb	3/15	7-9 PM	Basic	Freedom Hill in Sterling Heights
	4/5	730 PM - 930 PM	Basic	L'Anse Cruse Amateur Radio Club in St. Clair Shores. L'Anse Cruse High School Cafteria
	4/19	7-9 PM	Basic	Freedom Hill in Sterling Heights
Midland	3/2	7-9 PM	Basic	Public Schools Administration Center (600 E. Carpenter St.)
Monroe	3/7	7-9 PM	Basic	Monroe County Comm. (College Room 173 A & B)
	3/21	7-9 PM	Basic	Monroe County Comm. (College Room 173 A & B)
	4/6	7-9 PM	Advanced	Monroe County Comm. (College Room 173 C & D)
Oakland	3/1	7-9 PM	Basic	Oakland County Emergency Operations Center (EOC)
	3/4	7-9 PM	Basic	Farmington Hills Emergency Management Office
	3/7	7-9 PM	Basic	Novi Community Center
	3/16	7-9 PM	Basic	Oakland County Emergency Operations Center (EOC)
	3/24	7-9 PM	Basic	City of Southfield Civic Center
	3/28	7-9 PM	Advanced	Troy Parks and Recreation Department
	4/1	10 AM -3 PM	Basic & Advanced	Oakland County Emergency Operations Center (EOC)

	4/15	7-9 PM	Advanced	Groveland Fire Department
Saginaw	3/22	7-9 PM	Basic	Covenant Health Care Auditorium
Sanilac	4/4	630 PM -830 PM	Basic	Cooperative Extension Conference Room (37 Austin Street)
Shiawassee	3/21	7-9 PM	Basic	Owosso Fire Dept.
Tuscola	3/28	7-9 PM	Basic	Detroit Edison Building at 4100 Doerr Rd. in Cass City
	4/26	7-9 PM	Advanced	Detroit Edison Building at 4100 Doerr Rd. in Cass City
Washtenaw	3/8	7-9 PM	Basic	Chelsea UAW Hall (2795 M-52)

Continued Upcoming SKYWARN Training Sessions*

County	Date	Time	Type	Location
Washtenaw (Continued)	3/22	7-9 PM	Basic	Mill Creek Middle School in Dexter
	4/15	930 AM -330 PM	Basic & Advanced	Strong Physical Science Building on EMU Campus
Wayne	3/3	730 PM -930 PM	Basic	Motor City Amateur Radio Club. (St. Timothy Church, Trenton)
	3/4	930 AM -1130 AM	Basic	Plymouth Twp Fire Dept. (Corner of Ann Arbor Rd and Lilly)
	3/25	930 AM -230 PM	Basic & Advanced	Complient Building at 38140 Executive Drive North in Westland

*** Check with your county or local Emergency Manager for information on these sessions and for the latest updates to this list. You can also check our web site at: http://www.crh.noaa.gov/dtx/talks.htm**

Snowfall Spotting

Darin J. Figurskey, WCM

During the end of 1999, our Four Seasons Spotter and Safety Training sessions took us to six counties in southeast Michigan. The National Weather Service, through the county offices of emergency management, conducted presentations in Washtenaw, Saginaw, Macomb, Monroe, Shiawassee, and Lenawee Counties. Normally, the National Weather Service conducts about six to eight of these presentations at various locations in southeast Michigan during mid to late fall. With 17 counties being served by the National Weather Service office in White Lake, if we didn't conduct a Four Seasons/Winter Weather session in your county in 1999, chances are we will try to make it to your county in the fall of 2000.

Part of the Four Seasons/Winter Weather Safety and Spotter Training centers around reporting snow. Snowfall spotting is very important. By relaying information about snow accumulations, the National Weather Service, through information placed into public information statements and short-term forecasts, can keep many people informed as to the intensity of a winter storm. Also, if reports of snow are showing the "white stuff" piling up faster than anticipated, the National Weather Service can quickly react with updated forecasts. Sometimes, advisories or warnings are issued based on the information from a spotter, which can possibly save lives.

On the morning of November 30, 1999, lake-effect snow bands moved onshore across northern St. Clair County. An initial report of 3" of snow, with snow continuing at a good rate, was received from a Four Seasons spotter just north of Port Huron at 745 AM. Though advisories were in effect farther north over Huron and Sanilac Counties, no advisory was in effect for St. Clair County. Based on the information from the spotter, a lake-effect snow advisory was issued for St. Clair County. Less than 2 hours later, the same spotter phoned in a report of 5", with snow still falling. Since 6" in 12 hours or less is warning criteria, the advisory was upgraded to a lake-effect snow warning for St. Clair County at 947 AM. Ultimately, by the time the snow tapered off around noon, 7" of snow fell in Port Huron.

In this event, the timely reports from the spotter were crucial, resulting in the issuance of forecasts appropriate for the situation. We at the National Weather Service appreciate the spotter's efforts. For those who are snowfall spotters, here is a review of the criteria for snowfall reports:

- Report when the first inch has fallen, then every second inch thereafter.
- Report a final storm total.
- In the morning and evening, usually between 7 AM/PM and 9 AM/PM, report any new snow of an inch or greater.
- Anything less than an inch, report via the Internet on the White Lake office's home page.

Thanks to all of those who have provided outstanding snowfall reports this winter season. Of course, winter may have some punch left. Some of the largest snowfalls in southeast Michigan have occurred in March and early April. Keep those snowfall reports coming in!

Is the Ice Safe?

Jeff Boyne, Forecaster

The answer to the question in the title of this article is a very simple one: Ice is ***never*** safe! Even if the ice is a foot thick in one area of a lake, it can be one inch thick just a few yards away! Please follow the following ice safety rules from the United States Coast Guard:

1) Venturing out alone on the ice is ***not*** advisable. Use the buddy system! Whether on foot or snowmobile, spread out. This not only distributes weight for less stress on the ice, but also boosts the chances that one buddy will be able to get help by either cellular phone or yelling out. After contacting help, the buddy

can aid in the rescue if you are carrying a rope or other survival gear.

2) Leave details of your plans with a family member or friend!

3) Know the body of water (this includes the channels, currents, and seemingly inexplicable warm spots common to most lakes)! You can contact a local resort or bait shop for information about known thin ice areas. Also, check at the access if there are signs that indicate an aeration system in operation on the lake. These aeration systems keep areas of water open to provide oxygen for fish. The ice can be weakened many yards beyond where the ice is actually open. Stay well outside the fenced areas indicated by diamond-shaped thin ice signs.

4) Wear a life jacket. Life vests or float coats provide excellent floatation, as well as protection from hypothermia (loss of body temperature). However, ***never*** wear a life jacket if you are travelling in an enclosed vehicle, because it could hamper your escape in case of a breakthrough.

5) Carry a pair of homemade ice picks or even a pair of screwdrivers tied together with a few yards of strong cord that can be used to pull yourself up and onto the ice if you do fall in. Be sure they have wooden handles so if you drop them in the struggle to get out of the water, they won't go straight to the bottom.

6) Avoid driving on the ice whenever possible! Travelling in a vehicle on ice, especially early or late in the season, is simply "an accident waiting to happen." If you do decide to drive out onto the ice, be prepared to bail out in a hurry. You should drive with the window rolled down, doors ajar, and seat belt unbuckled.

7) If you can't see it, don't trust it! Stay away from ice that is covered in snow (which can trap solar warmth) or from ice of unknown thickness! Also, don't go out on the ice at night or when visibilities are reduced by fog or falling snow, because it increases your chances of encountering a weak spot in the ice or getting lost.

8) Stay away from open water!

9) Remember that ice is weakest near vegetation, pilings, docks, and anywhere in which the water moves in or out of the lake.

10) Don't be fooled by the weather on any given day. Consider the temperatures of the past week or month and stay off the ice while it is raining or after it has rained.

11) Avoid ridges, cracks, and holes. These can indicate areas of weak ice.

12) Avoid alcoholic beverages! Alcohol increases your chances for hypothermia and increases the likelihood that you'll make a stupid mistake that will cost the life of you or your companion.

13) Finally, maintain the right attitude. Recognize that ice safety takes three key elements – experience, caution, and luck. Take luck out of the equation, even if it means staying off the ice!

Spotter Tip: Lightning Safety

Darin J. Figurskey, WCM

Skywarn spotters often attempt to obtain the best vantage point to see particular cloud features associated with a thunderstorm. Sometimes, the view from an automobile is sufficient. On other occasions, spotters may find themselves outdoors, in an open area on a high plain, trying to get the best view of the storm. Of course, those who are outdoors, especially under or near tall trees and on or near hilltops, are most at risk from the dangers of lightning produced by a thunderstorm.

In every basic Skywarn spotter training session conducted by the National Weather Service, the dangers of lightning are discussed. The dangers are very real! In 1999, one person was killed and five individuals were known to be injured due to lightning strikes in southeast Michigan alone. Damage due to lightning was estimated at $150,000. On average across the United States, lightning kills more people every year than either tornadoes or hurricanes. Additionally, though only 10% of thunderstorms meet severe criteria (hail at least 3/4-inch in diameter, wind 58 mph or greater, or tornado), *every* thunderstorm contains lightning.

A good rule of thumb to remember is, "If you are close enough to the storm to hear thunder, you are close enough to get struck by lightning." Lightning can strike many miles away from the parent thunderstorm. Lightning often strikes outside of heavy rain and may occur as far as 10 miles away from any rainfall.

If you are caught outdoors and no shelter is nearby, find a low spot away from trees, fences, and poles, but make sure the low spot isn't subject to flooding. If you are in the woods, take shelter under the shorter trees. If you feel your skin tingle or your hair stand on end, lightning may be about to strike! Squat low to the ground on the balls of your feet. Place your hands on your knees with your head between them. Make yourself the smallest target possible, and minimize your contact with the ground.

Even when you are not spotting, remember lightning safety when thunderstorms are nearby or overhead. If a thunderstorm is nearby and you are engaged in outdoor activities, it is a good idea to postpone those activities until the thunderstorm is well past your location.
If you are boating or swimming, keep an eye to the sky, and if threatening weather approaches, get to land and find shelter immediately.

Skywarn spotters are a valuable resource to the National Weather Service, law enforcement, emergency management, and the millions of people who live and work in southeast Michigan. Though your reports are important, safety should be a spotter's primary concern. Remember, we want to be able to get your reports for years to come.

1999 Southeast Lower Michigan Tornado Summary

Jeff Boyne, Media Specialist

During 1999, six tornadoes touched down in southeast Lower Michigan. The first tornado of the year occurred on May 6th at 4:50 PM. The weak tornado (rated as a F-0 by the National Weather Service) touched down in a field just west of Clifford (Lapeer County) and then proceeded north-northwest into southern Tuscola County. The tornado dissipated about 4 miles southwest of Kingston (Tuscola County). It appears that the tornado was intermittently on the ground for approximately 2 miles, and eyewitnesses estimated the tornado to be 200 feet wide. This tornado was the 16th tornado to strike Lapeer County since reliable records began to be kept in 1950, and the first tornado in Lapeer County since July 2, 1997.

On May 23rd, the 2nd and 3rd tornadoes of 1999 occurred. Around 4 PM, the first tornado of the day occurred. The weak tornado (rated as a F-1 by the National Weather Service) touched down just west of Rose Center in Lenawee County. This tornado damaged a couple of barns and broke several trees in half. The tornado travelled approximately 5 miles and it was estimated to be a 100 feet wide. This was the 30th tornado to strike Lenawee County since reliable records began to be kept in 1950, and the first tornado in Lenawee County since March 28, 1998.

The second tornado of the day (May 23rd) occurred just before 8 PM. The weak tornado (rated as a F-1 by the National Weather Service) touched down 2 miles north of Imlay City in Lapeer County. The tornado uprooted several trees, pushed a house off of its foundation, and took the roof off yet another home. The family in the house that lost its roof saw the tornado coming and they immediately went to the basement. It was this quick action that kept anyone from being hurt or killed. Several eyewitnesses reported that the tornado was about 50 feet wide. Another interesting thing with this tornado is that none of the eyewitnesses said they saw any lightning. Footage captured by residents in the Imlay City area was delivered to the White Lake office and showed a very impressive display of the tornado as it did some property damage and moved across a field. Spotters can look forward to seeing this tornado in the next spotter and safety training season in 2000!

The 4th tornado of the year occurred on the evening of May 31st. This tornado moved through the north side of the city of Midland and it caused damage to the Holiday Inn, a church, and some trees and homes. This tornado was categorized by the National Weather Service as a F-2 on the Fujita scale and it was one of the strongest tornadoes in Midland County since accurate records began to be kept in 1950. It is also only the 8th tornado confirmed in Midland County since 1950.

On the evening of July 28th, a supercell developed over Sanilac County and tracked southeast into St. Clair County. This supercell prompted the issuance of three Tornado Warnings (two in Sanilac County and one in St. Clair County). A subsequent survey by NWS personnel confirmed a tornado in St. Clair County about 1 mile west-southwest of Jeddo, but none was confirmed in Sanilac County. The St. Clair County tornado, the 5th of the 1999 severe weather season, was rated a F-1 on the Fujita scale, and struck at 8:05 PM. This tornado was the 17th to strike St. Clair County since reliable records began to be kept in 1950, and the first tornado in St. Clair County since June 22, 1996.

The 6th and final tornado of the year made an appearance during the Weather Garden segment on WNEM-TV Channel 5's Take 5 Newscast. Chief Meteorologist Mark Torregrossa and photojournalist Gary Linkowski filmed a weak F-0 tornado on the Fujita Scale as it developed about 2 miles east-southeast of Reese in Tuscola County. According to eyewitness reports, the tornado touched down briefly around 5:20 PM. Other than picking up some soybean plants, there were no other reports of damage with the tornado. The tornado developed as a result of very cold air aloft and the interaction with a lake breeze boundary. This tornado was the second tornado to hit Tuscola County in 1999.

Tornado Climatology for Southeast Lower Michigan

Jeff Boyne, Media Specialist

During 1999, six tornadoes occurred in southeast Lower Michigan. This was just one tornado below the 1950-1999 southeast Lower Michigan annual tornado average. Since 1950, 320 confirmed tornadoes have struck the 17 counties in southeast Lower Michigan. This comes to an average of about 7 tornadoes (6.53) per year. There have been 7 years (1950, 1952, 1959-61, 1970, and 1981) in which no tornadoes were confirmed in our area. In 1973, the highest number (22 tornadoes) of tornadoes occurred. During that year, 12 of the 17 counties had at least one tornado. The only other year to have 20 tornadoes or more was 1974, when 20 tornadoes occurred. Like 1973, 12 out of 17 counties had at least one tornado. These two years really stand out in the records, because no other year had more than 14 confirmed tornadoes.

***Southeast Lower Michigan County Breakdown of Tornadoes since 1950*:**

Looking at **Figure 1** below, one can see easily see that Genesee County has had the most confirmed tornadoes (34) since 1950. The least amount of tornadoes occurred in the Saginaw Valley and Thumb Area. Only about 30 percent (29.1%) of all confirmed tornadoes have occurred in these areas. This may have to do with the effects of Lake Huron and Saginaw Bay. However, it may also be, in part, due to the smaller population in these areas.

Figure 1: # of Reported Tornadoes Since 1950

When did the last tornado occur in each County?

From **Figure 2** below, one can see that almost every county in southeast Lower Michigan has had a confirmed tornado during the 1990s. The one lone exception is Bay County which has not had a confirmed tornado since June 12, 1984. Another notable thing in **Figure 2** is that 5 counties (Saginaw, Livingston, Oakland, Macomb, and Wayne) had their last tornado on July 2, 1997. On this date, the largest number of tornadoes in a single day occurred in southeast Lower Michigan and also for the state of Michigan. During that afternoon and early evening, 16 tornadoes touched down in Lower Michigan. Thirteen of these 16 tornadoes touched down in southeast Lower Michigan. During this outbreak, there were two F-3 tornadoes (both in Genesee County), one F-2 tornado (in Wayne County), nine F-1 tornadoes (4 in Saginaw County; 2 in Genesee County; and 1 in Lapeer, Livingston, & Oakland Counties), and one F-0 tornado (Wayne County).

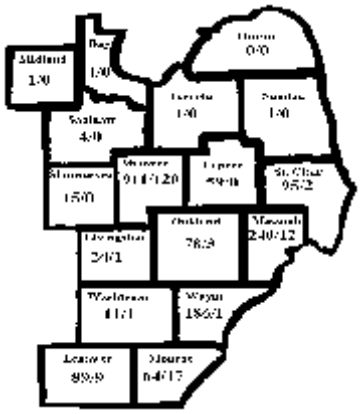


Figure 2: The Date of the Last Reported Tornado

Tornado Injuries & Deaths in Southeast Lower Michigan:

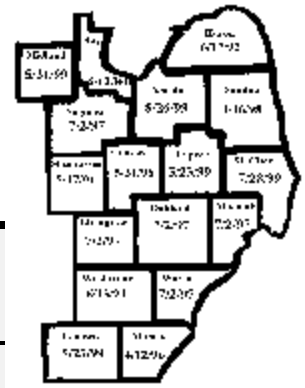
Since 1950, tornadoes in southeast Lower Michigan have caused 1,783 injuries and 166 deaths. By looking at **Figure 3** below, one notices that the most injuries and deaths have occurred in Genesee County. Since 1950, tornadoes have caused 911 injuries and 120 deaths in Genesee County. Most of these injuries and deaths can be attributed to one tornado. It occurred on June 8, 1953 and it became known as the "Flint/Beecher Tornado". The tornado moved from 2 miles north of Flushing, devastating the north part of Flint, and ended 2 miles north of Lapeer. The tornado virtually obliterated all homes on both sides of Coldwater Road for about a mile. It was there that the damage swath was over a half mile wide, and most of the deaths occurred. There were multiple deaths in at least 20 families. It caused 115 deaths and 844 injuries! This makes it the 9th deadliest tornado in United States history and the last tornado to kill more than 100 people! As a matter of fact, we have not had a F-5 tornado in southeast Lower Michigan since that day.

The only other counties with over 100 injuries are Macomb and Wayne. In Macomb County, tornadoes have caused 240 injuries since 1950. Nearly all of these injuries occurred in one tornado. This tornado touched down near Anchor Bay on May 8, 1964. It hurled cars hundreds of feet into houses. The tornado caused 11 deaths and 224 injuries! In Wayne County, tornadoes have caused 186 injuries since 1950. Nearly ½ of these injuries (90) occurred during the evening of July 2, 1997. On this day, 13 tornadoes touched down in southeast Lower Michigan causing 97 injuries and 2 deaths. The second highest number of injuries caused by a tornado in Wayne County occurred during the evening of July 4, 1969 when 50 injuries occurred.

Figure 3: 1950-99 Southeast Lower Michigan Tornado Injuries/Deaths

The Strength of Southeast Lower Michigan Tornadoes:

Since 1950, just over 61 percent (61.6%) of southeast Lower Michigan tornadoes have been classified as weak tornadoes (F-0 and F-1). About a third (31.8%) of the tornadoes were classified as strong (F-2 and F-3). Finally, just under 6 percent (5.6%) of the tornadoes were classified as being violent (F-4 and F-5). The last violent tornado to occur in southeast Lower Michigan was on March 20, 1976 in West Bloomfield (Oakland County).



The following table shows a county breakdown of tornado intensities since 1950:

1950-1999 Michigan Intensities					Southeast Lower Tornado		
County	Not Rated	# F0	# F1	# F2	# F3	# F4	# F5

Bay	0	4	2	3	1	0	0
Genesee	0	9	10	9	4	1	1
Huron	1	3	2	1	1	0	0
Lapeer	0	4	10	0	0	1	1
Lenawee	0	10	10	7	1	2	0
Livingston	0	4	3	9	2	1	0
Macomb	1	5	6	2	2	1	0
Midland	0	3	3	2	0	0	0
Monroe	0	6	9	6	2	4	0
Oakland	0	5	10	7	3	2	0
Saginaw	0	1	9	4	1	0	0
St. Clair	1	0	9	3	2	2	0
Sanilac	0	2	8	0	1	0	0
Shiawassee	0	3	9	7	0	1	0
Tuscola	0	2	6	4	0	0	0
Washtenaw	0	4	9	6	3	0	0
Wayne	0	12	5	7	2	1	0
Totals	**3**	**77**	**120**	**77**	**25**	**16**	**2**

When Do Tornadoes Occur in Southeast Lower Michigan?

A) Time of Year: Since 1950, just under 96 percent (95.9%) of tornadoes in southeast Lower Michigan have occurred between the months of April and September. The month of June was the most active with nearly 27 percent (26.9%). Meanwhile, both January and December were the least active with no tornadoes since 1950. The earliest tornado occurred on February 28, 1974 (Wayne County) and the lastest tornado occurred November 27, 1989 (Shiawassee County). The following table gives a monthly breakdown of tornadoes for all 17 counties in southeast Lower Michigan:

1950-1999 Southeast Lower Michigan
# of Tornadoes by Month

County	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Bay	0	0	0	1	0	5	3	0	1	0	0	0
Genesee	0	0	0	1	2	9	9	7	5	1	0	0
Huron	0	0	0	0	1	5	2	0	0	0	0	0
Lapeer	0	0	0	2	2	6	4	2	0	0	0	0
Lenawee	0	0	2	7	6	7	2	6	0	0	0	0
Livingston	0	0	0	2	5	3	4	4	1	0	0	0
Macomb	0	0	1	1	4	5	4	1	0	1	0	0

Continued 1950-1999 Southeast Lower Michigan
# of Tornadoes by Month

County	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Midland	0	0	0	2	2	3	0	0	1	0	0	0
Monroe	0	0	3	7	3	6	1	5	2	0	0	0
Oakland	0	0	1	4	5	4	6	3	4	0	0	0
Saginaw	0	0	0	2	1	6	4	2	0	0	0	0
St. Clair	0	0	1	0	5	4	2	1	4	0	0	0
Sanilac	0	0	0	3	1	3	2	0	2	0	0	0
Shiawassee	0	0	0	6	1	3	0	8	1	0	1	0
Tuscola	0	0	0	1	2	5	2	2	0	0	0	0
Washtenaw	0	0	0	4	6	6	4	2	0	0	0	0
Wayne	0	1	0	3	3	6	6	5	2	0	1	0
Totals	**0**	**1**	**8**	**46**	**49**	**86**	**55**	**48**	**23**	**2**	**2**	**0**

One interesting thing to note is that Lake Huron and Saginaw Bay retard the development of tornadoes during the early spring months. The reason for this is that the cold water temperatures keep the warm sector of the storm system south of this area. As a result, the weather conditions are usually **not** conducive for the development of tornadoes.

***B) Time of day*:** The following table gives the number of tornadoes reported in southeast Lower Michigan for each hour of the day from 1950 to 1999:

1950-99 Reported Tornado Times
in Southeast Lower Michigan

Time (EST)	# of Tornadoes	Time (EST)	# of Tornadoes
12 AM-1 AM	12	12 PM-1 PM	5
1 AM-2 AM	2	1 PM-2 PM	13
2 AM-3 AM	0	2 PM-3 PM	32
3 AM-4 AM	2	3 PM-4 PM	39
4 AM-5 AM	4	4 PM-5 PM	44
5 AM-6 AM	2	5 PM-6 PM	44
6 AM-7 AM	1	6 PM-7 PM	34
7 AM-8 AM	0	7 PM- 8 PM	23
8 AM-9 AM	1	8 PM-9 PM	23
9 AM-10 AM	3	9 PM-10 PM	9
10 AM-11 AM	3	10 PM-11 PM	11
11 AM-12 PM	7	11 PM-12 AM	6

From this table, one can see that just over 94% (94.3%) of the confirmed tornadoes in southeast Lower Michigan occurred between 11 AM and 1 AM. The most tornadoes (44) in one hour occurred between 4 PM and 5 PM and again between 5 PM and 6 PM . Nearly 28% (27.5%) of the tornadoes occurred during these 2 hours. The following table is a breakdown of time of occurrence by county:

1950-1999 Southeast Lower Michigan Tornado Occurrence Times

County	12AM -6AM	6AM -12PM	12PM -6PM	6PM -12AM
Bay	0	1	6	3
Genesee	3	0	23	8
Huron	0	0	4	4
Lapeer	2	0	8	6
Lenawee	5	1	12	12
Livingston	1	1	9	8
Macomb	0	2	11	4
Midland	0	1	5	2
Monroe	1	1	13	12
Oakland	0	3	17	7
Saginaw	0	0	8	7
St. Clair	2	1	7	7
Sanilac	1	0	7	3
Shiawassee	2	0	14	4
Tuscola	0	2	6	4
Washtenaw	4	0	11	7
Wayne	1	2	16	8
Totals	**22**	**15**	**177**	**106**

The above table shows that there is no geographical relationship to the time when the tornadoes occurred. All 17 counties showed their greatest number of tornadoes occurred between 12 PM and 6 PM.

Top 10 Weather Events of the 20th Century

Raymond G. O'Keefe, Assistant WCM

During November and December 1999, the Detroit/Pontiac National Weather Service office conducted two web-based polls to select the top 10 weather events of the 20th Century in Southeast Lower Michigan. One poll tapped the expertise of weather professionals in the area, while the other poll sought public opinion. Twenty-one weather events spanning the Century were selected as candidates for the top 10. A list and description of these events are available on the following web site:

http://www.crh.noaa.gov/dtx/contend.htm.

When all the numbers were counted, the pros and public agreed that the Flint-Beecher tornado was the top weather event of the Century across the region. The tornado, an F-5 on the Fujita Scale, struck the Flint area on June 8, 1953. The tornado killed 115 people and this was the last tornado in the United States to kill over 100 people. In addition, this tornado is the only F-5 tornado to strike Southeast Michigan since accurate record keeping began in 1950.

Two other tornadic episodes made both lists: the Palm Sunday tornado outbreak of April 11, 1965, and the tornado outbreak of July 2, 1997. The Palm Sunday tornadoes produced five F-4 tornadoes across Lenawee and Monroe counties. These killed 22 people. Thirteen tornadoes were recorded during the July 2nd outbreak — the most ever recorded in one day across Southeast Lower Michigan. The 1997 tornadoes killed 2 people and caused $90 million worth of property damage in Wayne County — the most ever in that county from a tornado.

The Pros and the Public also agreed on the number two selection – the "White Hurricane of 1913". This early winter storm wreaked havoc on Lake Huron, killing over 200 sailors and sinking eight ships. Winds to 70 mph were clocked at Detroit, with waves to 35 feet reported on Lake Huron.

The complete Pro list is on the cover of this newsletter. Here is the remainder of the Public list:

3. Palm Sunday Tornado Outbreak - 1965
4. Tornado Outbreak - 1997
5. Thanksgiving Weekend Storm - 1974
6. Saginaw Valley/Thumb Floods - 1986
7. Snowiest week of the Century - 1900
8. Snow and Cold - 1999
9. Dry and Hot - 1988
10. Snowstorm - 1978

Complete details on all these events can be found at this web site:

http://www.crh.noaa.gov/dtx/results.htm

Michigan Slides & Videos Still Wanted

Jeff Boyne, Forecaster

During the past year, there have been a number of severe weather events. The NWS Detroit/Pontiac has collected video from spotters and from footage we shot ourselves. We continue to strive for a Michigan presence in our spotter training sessions.

If you would like to contribute and have video or pictures of a significant weather event, please send it to the NWS Detroit/Pontiac at:

National Weather Service
Attention: The Four Season Observer
9200 White Lake Road
White Lake, MI 48386

We will copy the video or make the picture into a slide and then send it back to you. Thank you!